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'Miracle' gene therapy trial halted

14:30 03 October 02

NewScientist.com news service

A "miracle" gene therapy treatment for children suffering from the fatal "bubble boy" disease has been halted in France, after one of the patients developed leukaemia as a direct consequence of the treatment. However, British doctors argue that without the treatment many of the patients are certain to die, and say a similar trial in UK will continue.

Boys with X-SCID (Severe Combined Immunodeficiency) have a faulty copy of a gene on their X chromosome that makes an immune protein called interleukin-2. As a result, they have no resistance to infection and die unless treated.

In 2000, a team led by Alain Fischer at Necker Hospital, Paris, carried out the first gene therapy treatment, which replaced the faulty gene. It was one of only a handful of successful gene therapy trials in people. In April 2002, the mother of a Welsh boy treated at Great Ormond Street hospital in London described his progress as "nothing short of a miracle".

A total of 15 patients, have been treated so far - 11 in Paris and four in London. But it was revealed on Thursday that one three-year-old patient has now developed leukaemia.

Uncontrolled production

The boy underwent gene therapy at the age of six months, and contracted chicken pox at two-and-a-half. His white cell count increased in response to the infection, as would be expected. But his bone marrow then started uncontrollably producing these cells.

Gene therapy involves shuttling the gene into a patient's cells using a harmless virus. But transferred genes cannot be targeted to insert into a specific part of a chromosome. And it appears, scientists say, that in this boy the new gene was inserted next to an oncogene, called Lmo2, triggering the leukaemia.

This kind of severe side-effect was not unanticipated. "In its original review of these studies, the UK Gene Therapy Advisory Committee recognised the possibility of cancer occurring as a result of

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this type of gene therapy,"
says Norman Nevin, GTAC's
chairman.

But Nevin confirmed that the
UK trials will continue: "GTAC
is satisfied that all parents and
children treated were
informed of this risk and
received appropriate
counselling prior to
treatment." The chances of
the gene being inserted next
to an oncogene are very low,
he adds.

Some children with X-SCID
are candidates for bone
marrow transplant treatments, but others will undoubtedly die
without gene therapy. Doctors at Great Ormond Street say two
UK patients have died in 2002, because they did not start gene
therapy in time. "It is ethically justifiable to go ahead with the
Great Ormond Street trials because of the benefits accrued from
the treatment," says Nevin.

The full investigation into the three-year-old's leukaemia will take
between 12 and 18 months. Doctors say he is responding well to
chemotherapy.

Emma Young

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